

The guidelines discussed in the next section will also help instructors in these and other activities that will enhance the effectiveness of the games they choose to use in their classrooms.

Guidelines for Selecting and Using Instructional Games

The literature on instructional games supports the following guidelines to help ensure that the use of a game will provide effective instruction in the classroom. The guidelines assume a basic understanding of the instructional systems development (ISD) process. ISD is a controlled process for designing and developing instructional systems and evaluating their effectiveness (see Branson, Rayner, Cox, Furman, King, & Hannum, 1975; Hays, 2006). Following the basic ISD process, the guidelines are organized in four sections: (a) Planning for including a game, (b) selecting a game, (c) using a game, and (d) evaluating a game. Table 11.2 lists the guidelines. This is followed by brief discussions of each guideline.

TABLE 11.2 ► Guidelines for selecting and using instructional games

SECTIONS	GUIDELINES
Section 1. <i>Planning for gameplay</i>	1.1 Document instructional objective(s)
	1.1.1 Review existing documentation of instructional objectives
	1.1.2 Develop new instructional objectives
	1.2 Review current instruction
	1.2.1 Review current instructional materials and approaches
	1.2.2 Document the deficiencies in current instruction
Section 2. <i>Selecting a game</i>	* 2.1 Review the events in the game
	* 2.1.1 Determine whether game events appropriately match learners' skills and challenges
	2.2 Review the requirements of the game
	2.3 Develop introductory materials for the game
Section 3. <i>Using a game</i>	3.1 Insert the game into your program of instruction
	✓ 3.2 Deliver an introduction to the game
	3.2.1 Explain how to play the game
	3.2.2 Explain how game events support instructional objectives
	✓ 3.3 Measure performance
	✓ 3.4 Deliver detailed performance feedback
Section 4. <i>Evaluating the game's effectiveness</i>	✓ 4.1 Determine whether average performance of learners has improved
	✓ 4.2 Determine whether the instructional program is more efficient

Section 1. Planning for Gameplay

The first group of guidelines addresses activities that need to be completed before deciding to use a game or a game-based approach. Some of the guidelines include sub-guidelines to help you conduct more detailed activities if you choose to do so. Thinking through this process to discern how the game will meet the learning objectives you've selected will help you incorporate it more effectively. As you review your files of past lesson plans and notes, you may find that you already have most of the material mentioned in the guidelines.

Guideline 1.1. Document Instructional Objective(s)

The first activity is to understand and document the nature and requirements of each item of information or task to be learned. This is accomplished by first documenting your instructional objective(s). A complete instructional objective contains three main parts. First, it contains a description of an *observable action* in terms of performance or behavior. The *action* or behavior states what a learner will do to demonstrate that he or she has learned what is required. It must include an action verb such as “*type a letter*” or “*select a menu option*.” Each objective should cover only one behavior and should include *only one verb*. If multiple behaviors or complicated behaviors are required, the objective should be broken down into *enabling objectives* that support the *main objective*.

The second part of an instructional objective includes at least one *measurable criterion* (standard) that states the level of acceptable performance in terms of quantity, quality, time, or other measures. The standard of performance answers questions such as “How many?” “How fast?” or “How well?” For example, how many correct answers did the student provide on a quiz? How fast did the student complete a series of exercises? How well did a student present an argument defending his or her position on a historical issue? A single instructional objective can contain more than one measurable criterion depending on the complexity of the task. However, as Clark (1995) cautioned, one should not fall into the trap of using only a time constraint because it is easier than finding another measure of performance. A time limit should only be used when it is required under normal working conditions.

The third part of an instructional objective includes the actual *condition(s)* under which the task will be observed. In addition, this portion of an instructional objective identifies the tools, procedures, materials, aids, or facilities to be used in performing the task. It is often expressed with a phrase, such as “without reference to the textbook,” “using a notebook and a pen or pencil,” or “using a calculator, paper, and pencil.”

Guideline 1.1.1. Review existing documentation of instructional objectives. If the instructional objectives have been documented in existing documents, such as class syllabi, department plans, task analyses, handbooks, and task lists, you should review these documents to ensure that they contain complete descriptions of each instructional objective in terms of actions, conditions, and standards.

Guideline 1.1.2. Develop new instructional objectives. If the learning task is not fully described in existing documentation or if the instructional requirements have changed, new instructional objectives need to be written. These objectives should include descriptions of actions, conditions,

and standards. If this is a new task, you may need to review the existing instruction for similar tasks.

Guideline 1.2. Review Current Instruction

Before you decide to use an instructional game, you need to understand how instruction is currently conducted. Review current instructional materials and collect inputs from other instructors.

Guideline 1.2.1. Review current instructional materials and approaches. Unless the instruction is for a totally new task, some form of instruction probably exists. You need to understand this current instruction if you are to improve it by adding gaming technologies. The current instructional materials, such as books, slides, animations, and simulations, should be reviewed to determine their effectiveness. Ask other teachers to tell you which instructional materials they find most effective for this learning objective.

Guideline 1.2.2. Document the deficiencies in the current instruction. If you are considering using a game for instruction, you may have identified a deficiency or deficiencies in the current instruction, or perhaps you think a game may make learning a particular set of facts or skills more enjoyable for your students. Reviewing the information under Guideline 1.2.1 may help to clarify the reason for using a game. By understanding current instructional deficiencies and needs, whether they are your own or arise from the curriculum, you will be able to forecast how a game may help to correct them. For example:

- ▶ A game could introduce new terms in a more realistic context.
- ▶ A game could allow the learners to practice new skills more efficiently than current instruction.
- ▶ A game could allow the learners to integrate knowledge and skills in realistic scenarios.
- ▶ A game could provide more efficient (i.e., faster) instruction.
- ▶ A game could give students feedback on their skill levels faster than current instruction to help them master each skill and advance to the next level.
- ▶ A game could provide individual incentives to master each skill, such as praise and a few moments of action play for fun.
- ▶ A game could provide a fresh approach for reviewing a particular set of facts or skills that students find difficult, making the learning less tedious and more enjoyable.

If you determine that a game cannot help correct identified instructional deficiency or cannot enhance current instruction, consider using an instructional approach other than a game.

Section 2. Selecting a Game

Before selecting any game for your classroom, completing the following activities will ensure that the gameplay fulfills instructional objectives. The most important activity is to understand the events that the learner will experience in the game and determine how closely these events match

your instructional objectives. Understanding the events in the game will help determine whether an existing game can be used or whether you need to modify the existing game or develop a new game.

Guideline 2.1: Review the Events in the Game

Any game consists of a series of events that are governed by rules and constraints. In Section 1, you detailed the instructional objectives for your specific instructional task. It is important that the game you select meets as many of these instructional objectives as possible. The more overlap between instructional objectives and game activities, the greater the probability of effective instruction (Hays, 2005, 2006, 2008). This is illustrated in Figure 11.1. You can determine this overlap by understanding how closely your instructional objectives resemble and are supported by the events that occur in the game. If the specific game events are not a close match with the tasks, conditions, and standards as documented in your instructional objectives, the game may not be suitable or may need to be modified. However, you still may be able to use the game if you explain the differences to your students and help them narrow the gap between game events and instructional objectives. This is discussed in Guideline 3.2.2.

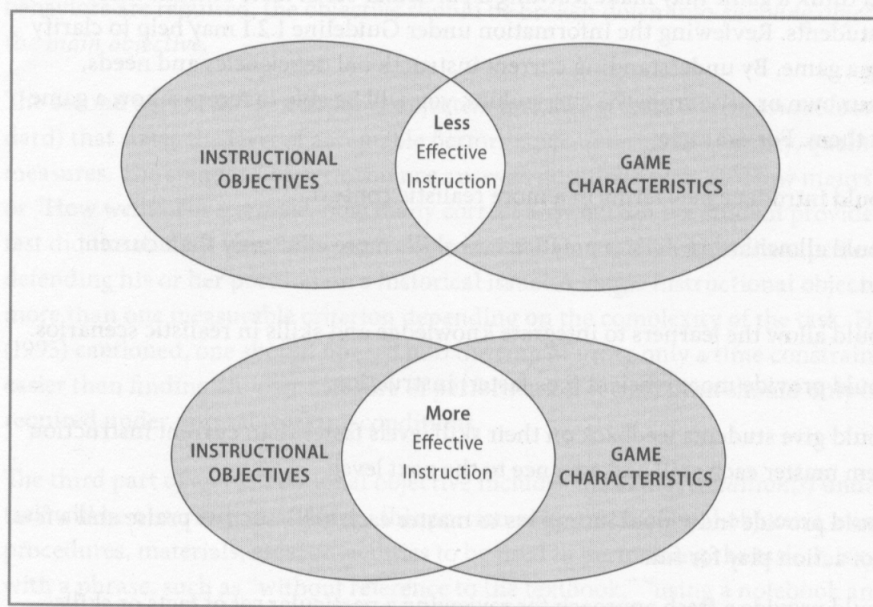


FIGURE 11.1 ► Instructional effectiveness as degree of overlap among instructional objectives and game characteristics

Guideline 2.1.1. Determine whether game events match learners' skills and challenges. Malone and Lepper (1987) developed a framework for designing intrinsically motivating instructional environments, and I slightly modified their framework to focus on instructional games (Hays, 2006). One of the most important motivational design recommendations is to ensure that the game provides an appropriate level of challenge for the learner. What does "appropriate level" mean? Csíkszentmihályi (1990) provides a way to judge appropriate level of challenge in his concept of "flow." He spent many years studying why people engage in various activities, including learning,